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Bulletin 458

June 1961

A stylized illustration of several oat leaves, rendered in a dotted, halftone pattern. The leaves are elongated and pointed, with a central vein visible. They are arranged in a cluster, with some overlapping, and are positioned on the left side of the cover, partially behind the title text.

**SPRING OAT
VARIETY TRIALS
IN WEST VIRGINIA
1952-1960**

**WEST VIRGINIA UNIVERSITY
AGRICULTURAL EXPERIMENT STATION**

THE AUTHOR

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MORGANTOWN

Spring Oat Variety Trials in West Virginia, 1952-1960

COLLINS VEATCH

Introduction

This publication presents the results of the spring oat variety trials conducted by the West Virginia University Agricultural Experiment Station for 1960 and immediately preceding years. These trials were grown on (1) the Agronomy Farm near Morgantown, (2) the Reedsville Experiment Farm, (3) the Ohio Valley Experiment Station near Point Pleasant, and (4) the Reymann Memorial Farms near Wardensville.

Importance of Oats

The production of oats and other small grains has declined in West Virginia in recent years. The West Virginia Cooperative Crop Reporting Service reported only 27,000 acres of oats in 1960, with an average yield of 41 bushels per acre and a total value of \$875,000.

Oats are the only spring grain grown extensively in West Virginia. They are often sown as a companion crop in the establishment of grass and legumes and are the preferred small grain for use as hay or silage.

Varieties

Many new varieties of oats have been developed in recent years, and new strains are constantly being tested in the never-ending attempt to secure disease resistance. The variety descriptions reported in this bulletin were assembled from various Experiment Station publications. Most of the varieties were developed by state Agricultural Experiment Stations in cooperation with the Agricultural Research Service of the United States Department of Agriculture. All of the varieties and strains have been tested in the Uniform Northeastern States Spring Oat Trial sponsored by A.R.S. of the U.S.D.A.

Andrew. Andrew was developed at Minnesota from a cross of Bond x Rainbow made in 1931 and released in 1949. It is resistant to Victoria blight, the smuts, and to all prevalent races of stem rust except races 8 and 10. It is an early-maturing, open-panicked, yellow-grained oat. Andrew has been one of the high-yielding varieties in West Virginia trials in recent years.

Ajax. Ajax was developed at the Dominion Laboratory of Cereal Breeding, Winnipeg, Manitoba, from a cross of Victoria x Hajira. It was distributed in 1941. It is resistant to Victoria blight and many races of stem rust, but is susceptible to crown rust and smut. Ajax has white, rather small kernels and average length and strength of straw. Yields have been quite variable.

Clarion. Clarion is a reselection from the cross Clinton x Marion produced through the cooperation of the U.S.D.A. and Iowa Agricultural Experiment Station. It is a good yielder with a large yellow grain of high test weight and good straw strength. It is medium-early in maturity and medium in height, resistant to oat smuts and prevalent races of stem rust except race 8. It is moderately susceptible to crown rust.

Clintonland. Clintonland is a selection from the cross of Landhafer x Clinton produced in Indiana. It has a heavy yellow kernel with good yield and strong straw and is medium-early and medium in height. It is resistant to most of the common races of crown rust, the oat smuts, race 8 of stem rust and Septoria black stem. It is susceptible to race 7 of stem rust and to yellow dwarf.

Clintonland 60. Clintonland 60 is similar to Clintonland except that it is resistant to race 7 of stem rust.

Clinton. Clinton originated as a selection from a cross between D69 and Bond made by the United States Department of Agriculture and the Iowa Agricultural Experiment Station. It was distributed in 1945. It is resistant to Victoria blight and has good resistance to stem rusts, crown (leaf) rusts, and to some strains of smut. It produces plump, yellow grain with a good test weight. Clinton has given good results and did fill a need for a variety resistant to Victoria blight. Some of the more recently developed varieties including some Clinton selections are now superior to the original Clinton.

Clinton 59. Clinton 59 is a selection from Clinton made at the Indiana Agricultural Experiment Station where it was released in 1948. It is similar to Clinton in disease resistance but more uniform in plant characteristics. Clinton 59 has given higher yields than Clinton in many West Virginia trials. It is recommended as an improved Clinton.

Columbia. Columbia is a selection from Fulghum made in Missouri where it was distributed in 1930. It is susceptible to stem and crown rust and smut but is resistant to Victoria blight. The grain is not very attractive, being brownish or greyish in color. It has given good yields in the past, but is being replaced by stronger-strawed, disease-resistant varieties, such as Missouri 0-205.

Garry Improved. Garry Improved is a Canadian selection, medium-late in maturing, with plump white kernels. It is susceptible to some races of crown rust.

Missouri 0-205. Missouri 0-205 is a selection from the cross Columbia x (Victoria-Richland). It is resistant to Victoria blight and many races of smuts. It is tolerant to race 45 crown rust and is resistant to races 2 and 7 of stem rust. The grain is brownish or greyish but has a thin hull and a high test weight.

Newton. Newton, an Indiana selection, has a heavy plump yellow kernel. It is medium-early in maturity and of medium height with good straw strength. It is resistant to crown rust, the smuts, Septoria leaf spot, and the common races of stem rust except 8. It has some tolerance to yellow dwarf.

Shield. Shield is a medium-early Canadian selection with comparatively short straw. It is resistant to races 7 and 7A of stem rust and smuts.

Shelby. Shelby is a selection from the progeny of the cross Anthony x Bond that was released by the Iowa Agricultural Experiment Station in 1949. It is highly resistant to crown rust, common races of stem rust, and nearly all smuts. It has a white, plump grain and a stiff straw.

The other strains or selections included in these trials have not been named. They are designated by the Cereal Investigation (C.I.) number, and represent the best strains from the Uniform Northeastern States Spring Oats Trials grown at Morgantown.

Methods

The yields reported in Tables 1 to 4 were based on randomized row trials with four replications. These trials were seeded by hand. The center row of each three-row plot was harvested with a Jari nursery harvester, dried, threshed, and weighed separately.

The oat varieties are grouped in the tables according to the number of years they have been grown at a location and arranged in order of yield. The 1960 yields are accompanied by the height of plants and comparative lodging where this information is available. The lodging scale used was based on visual observation at harvest time. In this estimation, 0 means no lodging, whereas 9 means that the oats were completely lodged, flat on the ground. In these yield trials, the low-yielding varieties are discontinued and new varieties are added from year to year. As a rule a new variety is first tested in the Morgantown trial; if it yields high there it is then included at other locations. Only those varieties which have stood comparison and are still in the trials are here reported. Columbia was continued primarily as a long-time check.

Discussion of Results

Yield is a measure of the response of a plant population to environmental conditions. The plant population, in a pure line variety, is assumed to be uniform in genetic composition. The producer is primarily interested in final production as measured by yield and quality.

MORGANTOWN-AGRONOMY FARM-TABLE 1

This table includes the average yields of the varieties that have been grown at Morgantown for the past eight and four years as well as the yields for 1960, along with height and lodging index of each variety.

At Morgantown, Missouri 0-205 and Clarion averaged 79.6 bu./A for the eight years, with Clinton 59 and Ajax yielding 77.1 and 76.9 bushels for the same period. Shelby and C.I. 5319 were also above the average (74.64) as well as within the range of the high yield less the L.S.D. (6.22).

The C.I. 5319 strain averaged 78 bushels for the four years. Clinton 59, Missouri 0-205, C.I. 6939, Clarion, C.I. 6933 and Shelby all yielded above the average of 72.10 bu./A. Shield and Andrew were slightly below the average in yield but they were still within the range of the highest yield less the L.S.D. (7.73). Clintland, Ajax, Clinton, and Columbia were all below the average and below the range indicated.

In 1960 the four high-yielding strains were new unnamed selections. The highest-yielding named variety was Clinton 59. Other varieties above average in yield were C.I. 6939, Shield, Missouri 0-205, and Shelby. Andrew and Ajax were below the average (64.18) in yield but well within the range of the high yield less the L.S.D. (15.47). The straw height varied from 35 inches for C.I. 5319 to 44 for Garry, a medium-late variety. Lodging varied from an index of 1.25 for C.I. 5319 to 7 for C.I. 7271. Clarion and Ajax lodged more than Missouri 0-205 or Clinton 59.

REEDSVILLE-EXPERIMENT STATION-TABLE 2

The oat trial at Reedsville lodged excessively in 1958 and was not harvested. In Table 2 the five-year data includes the yields for 1955, 1956, 1957, 1959, and 1960.

Of those varieties grown for eight years Ajax gave the highest average yield (64.38 bu./A) with Missouri 0-205, and Shelby within the range of the highest yield less the L.S.D. (3.93). Clinton 59 was just below this range but still above the average. Clinton, Andrew, and Columbia were below the average yield of the varieties grown for eight years.

Ajax was again the high-yielding variety among those grown for five years, 67.96 bu./A. Shelby, Clarion, Clintland, and Missouri 0-205 all

yielded above the average 61.78 and within the range of the highest yield less the L.S.D. (5.32). Clinton 59, Clinton, Andrew, and Columbia were all below the average in yield and below the range indicated.

The oat yields at Reedsville were quite variable in 1960, ranging from 54.8 bu./A for Columbia to 85.9 bu./A for C.I. 5964, with an average of 75.47 bu./A and an L.S.D._{.05} of 17.08 bu. Three new strains were high in yield but several varieties were well above the average and still others within the range of the high yield less the L.S.D. Lodging was no problem in this trial although some varieties did grow tall straw. For example, C.I. 6939 averaged 56 inches and Garry Improved 53 inches in height.

POINT PLEASANT—OHIO VALLEY EXPERIMENT STATION—TABLE 3

This location is not considered good spring oat territory. However, good yields may be produced if weather conditions permit early seeding.

The varieties grown for six years averaged 53.13 bu./A. Strain C.I. 5319 was high in yield, 60.85 bu./A. Missouri 0-205, Clintland, and Clarion were above the average in yield.

Shield and Shelby were outstanding in yield for the years 1959 and 1960. Missouri 0-205 was third in yield, for these two years, followed by three C.I. strains and Clarion. Other varieties below the average but still within the range of the L.S.D. were Andrew, Clintland 60, Ajax, C.I. 6939, and Clintland. Clinton 59, Columbia, and Clinton were low in comparative yield.

No records were taken in regard to height of plants or lodging at this location in 1960.

WARDENSVILLE—REYMANN MEMORIAL FARMS—TABLE 4

The spring oat variety trials at Wardensville in 1958 and 1959 were not harvested due to excessive lodging. The four- and eight-year averages do not take this loss into account. The four-year average includes the yields of the trials grown in 1960, 1957, 1956, and 1955. It is interesting to note that the averages and high yield less the L.S.D. ranges coincide so closely in this table that they give the same distribution of varieties.

Andrew, Missouri 0-205, and Ajax were the best-yielding varieties for the eight years recorded. Clinton, Shelby, Clinton 59, and Columbia were significantly lower in yield than Andrew.

For the four years recorded, C.I. 5319 was the highest in yield (50.4 bu./A), with Andrew, Missouri 0-205, Ajax, Clarion, Shelby, and Clinton all within the range of 50.4 less the L.S.D. (5.21).

Yields were comparatively low in 1960, Shield being high with 27.1 bu./A. Andrew, Clarion, Shelby, Clinton, Ajax, and five C.I. strains were all above the average in yield and within the range of the highest yield less the L.S.D. (6.53).

Summary

The results of these trials indicate variation in comparative varietal response at the different locations. Some varieties such as Shelby, Clarion, and Missouri 0-205 seem to have a wide adaptation.

The most important factor in securing good oat production, aside from variety and soil fertility, seems to be time of planting. All observations indicate that in this region spring oats should be seeded as early as possible.

HIGH YIELDING VARIETIES

Morgantown	Reedsville	Point Pleasant	Wardensville
Clarion	Ajax	Shield	Shield
Shelby	Shelby	Shelby	Shelby
Missouri 0-205	Clarion	Missouri 0-205	Missouri 0-205
Clinton 59	Missouri 0-205	Clarion	Clarion
Shield			Andrew
			Ajax

TABLE 1. YIELDS OF SPRING OATS FOR 1960 WITH FOUR- AND EIGHT-YEAR AVERAGES AT MORGANTOWN

C.I. No.	Variety or Parentage	Yield 1960		
		Bu/A	Ht. In.	Lodging 0-9
7460	(Wintok x Cl ² - SF) x Garry	77.1	39	6.75
5319	Fulton x Clinton	74.2	35	1.25
5964	Roxton x Victoria	74.1	40	2.75
7271	Minn. Sel.	72.8	40	7.00
4259	Clinton 59	72.2	38	1.75
6939	Wis. x 342-1-1	69.4	43	5.25
7209	Shield	68.3	37	2.25
4988	Mo. 0-205	68.0	39	1.50
4372	Shelby	65.5	39	2.75
4170	Andrew	61.9	40	6.00
6933	Ind. 422A-1-59-1-6	61.8	39	2.00
4157	Ajax	61.8	43	5.00
3971	Clinton	60.7	39	2.00
6662	Garry	60.1	44	2.25
2820	Columbia	59.7	40	2.50
5647	Clarion	57.3	41	5.25
6701	Clintland	56.9	37	2.00
7234	Clintland 60	53.8	36	2.50
7458	Oneida	44.3	40	7.25
No. Varieties		19		
Average		64.18		
L.S.D. .05		15.47		

Eight-Year Average		
C.I. No.	Variety or Parentage	Bu/A
4988	Mo. 0-205	79.6
5647	Clarion	79.6
4259	Clinton 59	77.1
4157	Ajax	76.9
5319	Fulton x Clinton	75.8
4372	Shelby	75.4
4170	Andrew	72.4
3971	Clinton	68.1
2820	Columbia	66.9
Average		74.64
L.S.D. .05		6.22

Four-Year Average		
C.I. No.	Variety or Parentage	Bu/A
5319	Fulton x Clinton	78.0
4259	Clinton 59	75.4
4988	Mo. 0-205	74.9
6939	Wis. x 342-1-1	74.4
5647	Clarion	74.3
6933	Ind. - 422A--	73.8
5372	Shelby	72.4
7209	Shield	72.0
4170	Andrew	71.1
6701	Clintland	70.1
4157	Ajax	68.8
3971	Clinton	66.7
2820	Columbia	65.5
Average		72.10
L.S.D. .05		7.73

TABLE 2. YIELDS OF SPRING OATS FOR 1960 WITH FIVE- AND EIGHT-YEAR AVERAGES AT REEDSVILLE

C.I. No.	Variety or Parentage	Yield 1960		
		Bu/A	Ht. In.	Lodging 0-9
5964	Roxton x Victoria	85.9	50	0
6939	Wisc. x 342-1-1	84.9	56	.5
6933	Ind. 422A-1-59-1-6	82.7	45	0
6662	Garry	82.4	53	0
7209	Shield	82.2	45	0
6642	Newton	81.2	48	0
4157	Ajax	79.0	50	0.0
4372	Shelby	78.8	48	0
7271	Minn. Sel.	76.6	45	0
4988	Mo. 0-205	76.5	50	.25
5319	Clinton x Fulton	75.9	40	0
7460	(Wintok x Cl ² - SF) x I. Garry	74.7	46	0
5647	Clarion	73.8	47	0
7234	Clintonland 60	72.3	41	0
3971	Clinton	71.7	44	0.0
6701	Clintonland	71.5	45	0
4259	Clinton 59	66.9	41	0.0
4170	Andrew	62.3	46	0.0
2820	Columbia	54.8	50	0.25
No. Varieties		19		
Average		75.47		
L.S.D. .05		17.08		

Eight-Year Average		
C.I. No.	Variety or Parentage	Bu/A
4157	Ajax	64.38
4988	Mo. 0-205	61.21
4372	Shelby	60.73
4259	Clinton 59	58.75
3971	Clinton	56.85
4170	Andrew	55.54
2820	Columbia	51.36
Average		58.40
L.S.D. .05		3.93

Five-Year Average		
C.I. No.	Variety or Parentage	Bu/A
4157	Ajax	67.96
4372	Shelby	65.36
5647	Clarion	64.64
6701	Clintonland	63.64
4988	Mo. 0.205	63.00
4259	Clinton 59	61.36
3971	Clinton	59.26
4170	Andrew	57.58
2820	Columbia	52.26
Average		61.78
L.S.D. .05		5.32

TABLE 3. YIELDS OF SPRING OATS FOR 1960 WITH TWO- AND SIX-YEAR AVERAGES AT POINT PLEASANT

C.I. No.	Variety or Parentage	1960 Bu/A
7209	Shield	78.4
4372	Shelby	78.0
6642	Newton	73.7
7271	Minn. Sel.	73.2
4157	Ajax	71.5
4170	Andrew	70.5
6933	Ind. 422A-1-59-1-6	70.3
4988	Mo. 0-205	69.4
6939	Wis. x 342-1-1	67.8
7460	(Wintok x Cl ² - SF) x Garry	67.1
5647	Clarion	65.6
6662	Garry	64.6
5964	Roxton x Vict.	64.5
5319	Fulton x Clinton	64.1
4259	Clinton 59	62.7
2820	Columbia	62.7
3971	Clinton	62.1
6701	Clintland	58.4
7234	Clintland 60	54.6
No. Varieties		19
Average		67.33
L.S.D., ₀₅		13.63

Six-Year Average			Two-Year Average		
C.I. No.	Variety or Parentage	Bu/A	C.I. No.	Variety or Parentage	Bu/A
5319	Fulton x Clinton	60.85	7209	Shield	63.70
4988	Mo. 0-205	60.23	4372	Shelby	63.13
6701	Clintland	57.37	4988	Mo. 0-205	59.95
5647	Clarion	56.50	5319	Fulton x Clinton	58.45
4259	Clinton 59	52.22	5964	Roxton x Vict.	57.75
4372	Shelby	51.43	6933	Ind. 422A-1-59-1-6	57.15
4170	Andrew	51.32	5647	Clarion	56.45
4157	Ajax	51.17	4170	Andrew	55.90
3971	Clinton	49.60	7234	Clintland 60	55.20
6939	Wis. x 342-1-1	48.75	4157	Ajax	55.13
2820	Columbia	45.03	6939	Wis. x 342-1-1	54.65
Average		53.13	6701	Clintland	53.20
L.S.D., ₀₅		5.96	4259	Clinton 59	52.35
			2820	Columbia	50.35
			3971	Clinton	48.45
			Average		56.12
			L.S.D., ₀₅		11.2

TABLE 4. YIELDS OF SPRING OATS FOR 1960 WITH FOUR- AND EIGHT-YEAR AVERAGES AT WARDENSVILLE

C.I. No.	Variety or Parentage	Yield 1960		
		Bu/A	Ht. In.	Lodging 0-9
7209	Shield	27.1	44	1.75
7271	Minn. Sel.	27.0	46	3.50
7460	(Wintok x Cl ² - SF) x Garry	24.5	45	4.00
4170	Andrew	23.0	44	2.25
6933	Ind. 422A-1-59-1-6	22.9	42	2.00
5647	Clarion	22.4	44	2.25
5319	Clinton x Fulton	22.0	43	.75
4372	Shelby	21.3	47	2.50
3971	Clinton	21.3	43	2.50
4157	Ajax	20.8	47	3.00
5964	Roxton x Vict.	20.6	46	2.25
6662	Garry	20.4	46	1.25
6701	Clintland	17.9	45	3.00
6939	Wis. x 342-1-1	17.8	47	2.75
4259	Clinton 59	16.8	43	1.75
2820	Columbia	14.9	45	3.00
4988	Mo. 0-205	14.5	45	2.00
7234	Clintland 60	14.4	44	1.00

No. Varieties

19

Average

20.45

L.S.D. .05

6.53

Eight-Year Average

C.I. No.	Variety or Parentage	Bu/A
4170	Andrew	43.1
4988	Mo. 0-205	42.8
4157	Ajax	40.8
3971	Clinton	37.6
4372	Shelby	36.9
4259	Clinton 59	35.0
2820	Columbia	34.6
Average		38.69
L.S.D. .05		3.53

Four-Year Average

C.I. No.	Variety or Parentage	Bu/A
5319	Clinton x Fulton	50.4
4170	Andrew	49.0
4988	Mo. 0-205	48.5
4157	Ajax	48.5
5647	Clarion	46.3
4372	Shelby	45.8
3971	Clinton	45.2
6939	Wis. x 342-1-1	43.4
6662	Garry	42.9
6701	Clintland	41.6
4259	Clinton 59	40.5
2820	Columbia	40.2

Average

45.19

L.S.D. .05

5.21

